DOCUMENT RESUME

ED 223 237 IR 010 488

TITLE	Wisconsin Business Data Processing Curriculum Guide.
INSTITUTION	Wisconsin Univ., Eau Claire.
SPONS AGENCY	Wisconsin State Dept. of Public Instruction, Madison. Bureau of Vocational and Career Education.
PUB DATE	Jun 80
NOTE	79p.; Best copy available.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Business Education; Business Education Teachers; *Computer Oriented Programs; *Curriculum Development; Curriculum Guides; *Data Processing; *Educational Resources; High Schools; *Proposal Writing; Teacher Certification

ABSTRACT

Prepared as a guide to assist business educators in meeting the need for data processing education, this handbook presents guidelines for incorporating data processing into existing business education classes in Wisconsin high schools and developing separate courses. Introductory materials include statements of goals and objectives, definitions of terms, and a rationale for teaching data processing. Subsequent chapters address (1) the development of the data processing program, including curriculum planning, equipment selection, and project procedures; (2) integration into existing business courses, ranging from accounting and business communications to shorthand and typing; (3) a recommended curriculum; (4) teacher certification; (5) equipment and facilities; (6) educational resources; (7) resource groups; (8) funding; and (9) curriculum articulation. Guidelines for writing a proposal and a listing of data processing acronyms and what they stand for are appended. (LMM)

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Data Processing Curriculum Guide

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WISCONSIN BUSINESS DATA PROCESSING CURRICULUM GUIDE

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This project was performed pursuant to a grant of contract with the State of Wisconsin Department of Public Instruction, Bureau for Vocational and Career Education. Contractors undertaking this project were encouraged to express freely their professional judgment in the development of the project. Points of view or opinions stated do not, therefore, necessarily represent official Department of Public Instruction policy.

The exhibits and forms in this manual are samples that can be used and/or modified to adapt to local needs.

This guide is not meant to discriminate on the basis of race, color, national origin, sex, or handicap. The responsibility for civil rights technical assistance to local school districts is that of the Office of Equal Educational Opportunities at the DPI.

Acknowledgements

ACKNOWLEDGEMENTS

The project directors and participants wish to thank the Department of Public Instruction, Mike Tokheim and Judy Byfield for their assistance in the development of this curriculum guide.

We also wish to thank the University of Wisconsin-Eau Claire for their financial help in the support of the project.

Kit Murray deserves our sincere thanks for her many hours and hard work in the preparation of the manuscript.

It should also be acknowledged that this guide is the product of five very intensive days of research and writing by the participants, plus a series of three separate "proofing and polishing" steps. Great care has been taken to prepare a usable guide. We recognize the need for suggestions and strongly encourage them. If you have suggestions for improvement of this guide, please direct them to :

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Introduction

INTRODUCTION

Business data processing is a rapidly changing and ever-advancing field. The computer has become a central force in business, in government, and in our everyday life. Because of this influence, the necessity for including data processing education in the business curriculum of Wisconsin high schools has become progressively important.

The computer is one of the most important machines used by business. One of the major responsibilities of every business educator is to stay current with the technological advancements in business. Many of the repetitive office functions are being computerized. To better prepare our students, the concepts of data processing and its changing role for the traditional office employee must be part of the business education curriculum.

Students today are being exposed to a wide variety of computer uses in the elementary schools in such areas as math and reading. Media exposure and applications in their daily lives have made many of today's students unafraid of computer technology. Computer games have become a part of their daily recreation. Business education must accept this challenge and take strides forward to educate the students in business careers and applications of data processing. A knowledge of data processing is rapidly becoming a requirement for an educated person.

This handbook was prepared as a guide to assist business educators to meet the need for data processing education. Data processing must be incorporated into existing business education classes and developed as a separate course. Teachers are urged to exercise their creative efforts to adapt and expand the suggestions included in this handbook as they seek to meet the individual needs of students.

GOALS OF A DATA PROCESSING PROGRAM

The major goals to be accomplished by a business data processing program are to:

--Develop computer literacy and an understanding of terminology.

--Develop career awareness through an exploration of career opportunities and requirements.

--Provide hands-on learning experience with data processing equipment.

--Provide an awareness of the technological changes in business data processsing.

--Provide an understanding of the capabilities of computers in business applications.

--Develop an awareness of data processing equipment and procedures.

--Develop problem-solving skills.

--Provide computer programming experiences with business applications.

--Develop an awareness of personal use of data processing.

OBJECTIVES

--To instill in students a desire to further their learning capabilities by creating their own projects and programs.

--To enable students to practice basic skills by providing a tool allowing them to devise projects and problems utilizing number, spelling, and vocabulary skills.

--To permit the formulation of business precepts, capable of being programmed into specific learning experiences.

DEFINITIONS

It is not the intention of this section to define all data processing vocabulary terms. There are many special terms that are necessary for the novice data processing instructor to understand. This list includes some of the basic terms used in this handbook.

DEFINITIONS:

Business Data Processing:	Handling data to produce meaningful information for the purpose of aiding management in the decision-making process.
Data:	"Raw," unorganized facts and figures.
Hardware:	Equipment; the physical devices that make up a computer system, including input, storage, central processing unit, and output.
Microprocessor:	The electronic component of the central processing unit created on a single silicon chip.
Peripherals:	Input and output devices other than the central processing unit that can be attached to a computer system.
Processing:	Handling facts and figures.
Software:	Programs and instructions written for computer systems; the consumable material which does not have permanent lasting quality.
Terminals:	Devices used for sending and receiving information from a computer at another location.
Word Processing:	The process of converting thoughts to printed words in the form of letters, manuscripts, and manuals using standard procedures, modern equipment, and qualified personnel.

TYPES OF SYSTEMS:

In-house:	All the parts of the computer system are located and controlled within the school.
Time-sharing:	Allows several users of a computer to use the system on a simultaneous basis. You may have a terminal in your school and communicate with a computer at another location.

Service Bureau:	An independent business that does the data processing for you. You prepare the data in your school and mail or deliver it to the business. The information is processed and returned to you.

TYPES OF MEMORY:

Memory:	Storage; the area within the computer which receives and holds program statements and data until called; often expressed in terms of K (approximately 1,000 units of information, e.g. 8K equals 8,000 units of storage).
RAM:	Random Access Memory; temporary storage area where processing occurs; usable memory of the computer.
ROM:	Read Only Memory; permanent storage area that permits data to be read only; manufacturer installed.

SIZES OF SYSTEMS:

Large Computer:	Large computer systems provide the fastest operating speeds and the greatest storage capacities of all other computer systems. Many alternate hardware configurations are possible as are sophisticated software packages.
Microcomputer:	A microcomputer is a small, portable, computer system commonly consisting of a CRT, keyboard, limited storage based on a microprocessor and generally costing less than $5,000.
Minicomputer:	A minicomputer is a medium-sized, in-house system; a scaled-down version of the traditional large computer where the processor is less powerful and results in a much lower overall cost for a computer system.

Why Teach Data Processing

BENEFITS OF DATA PROCESSING EDUCATION TO THE STUDENT AND THE COMMUNITY

Benefits to the STUDENT by Providing:

--"computer literacy" necessary to exist in our society today.

--a career exploration opportunity in which the student may assess interests, abilities, and aptitudes for the employment opportunities in Data Processing.

--work habits and attitudes necessary for individual maturity and job competence.

--the fundamental concepts needed for further study in Data Processing.

--a realistic environment for developing skills in a variety of entry-level positions.

--incentives to perform to the best of the student's ability.

--a feeling of accomplishment.

--an opportunity to learn how Data Processing equipment is operated.

Benefits to the COMMUNITY by Providing:

--employees with a basic understanding of data processing concepts.

--selected and motivated employees who have chosen a career objective related to their interests and aptitudes.

--an opportunity to keep classroom instruction consistent with current practices in business and industry through the use of advisory committees.

CAREERS

Students need to have an awareness of careers in data processing. Many high school students will eventually find employment in data processing-related fields. Therefore, career education should orient the students to specific careers available, including job descriptions, educational requirements, job conditions, and salary information.

JOB DESCRIPTIONS

A typical computer installation in a business organization is expected to perform at least three basic functions: system analysis and design, programming, and computer operation.

COMPUTER CENTER MANAGER: Responsible for planning, organizing, staffing and controlling all data-processing activity.

MANAGEMENT INFORMATION SYSTEM (MIS) MANAGER: Responsible for planning and tying together the entire information resources of the firm. Devise effective control mechanisms to monitor progress. Must have an understanding of the organization, its goals, and its business activities, motivate and control the personnel, and have a knowledge of data processing methods and equipment.

SYSTEMS ANALYST: Key person in the analysis, design, and implementation of the information system. Responsibilities include: determining information needs, analyzing existing system, designing new systems, and implementing changes.

APPLICATIONS PROGRAMMER: Converting system design into instructions for the computer.

MAINTENANCE PROGRAMMER: Debugging and improving existing programs. Integrating new programs into the system.

SYSTEMS PROGRAMMER: Maintaining system software, developing utility programs maintaining compilers and assemblers, deciding on hardware/software additions or deletions.

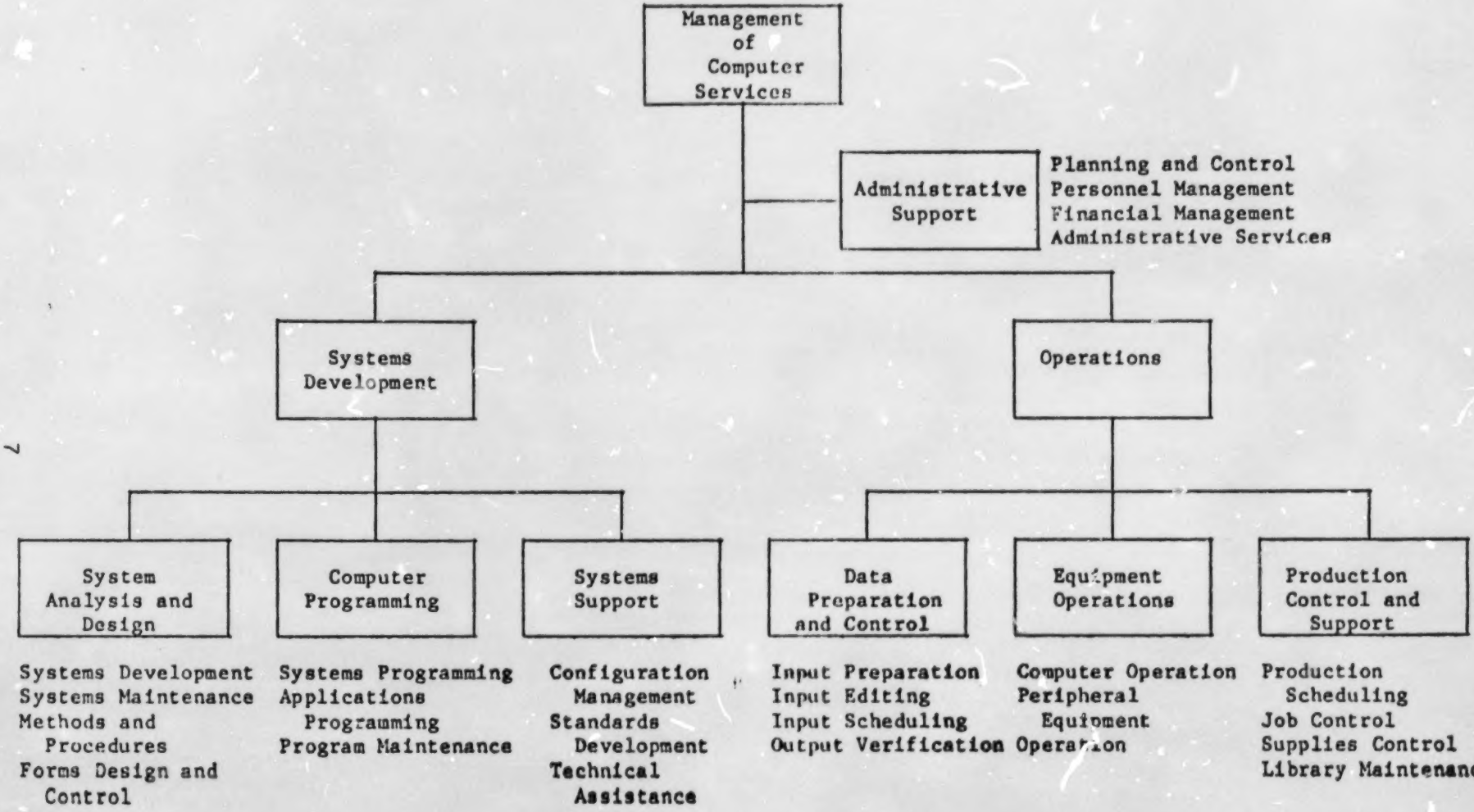
TECHNICAL CONTROL SPECIALIST: Responsible for hardware selection, operation and maintenance.

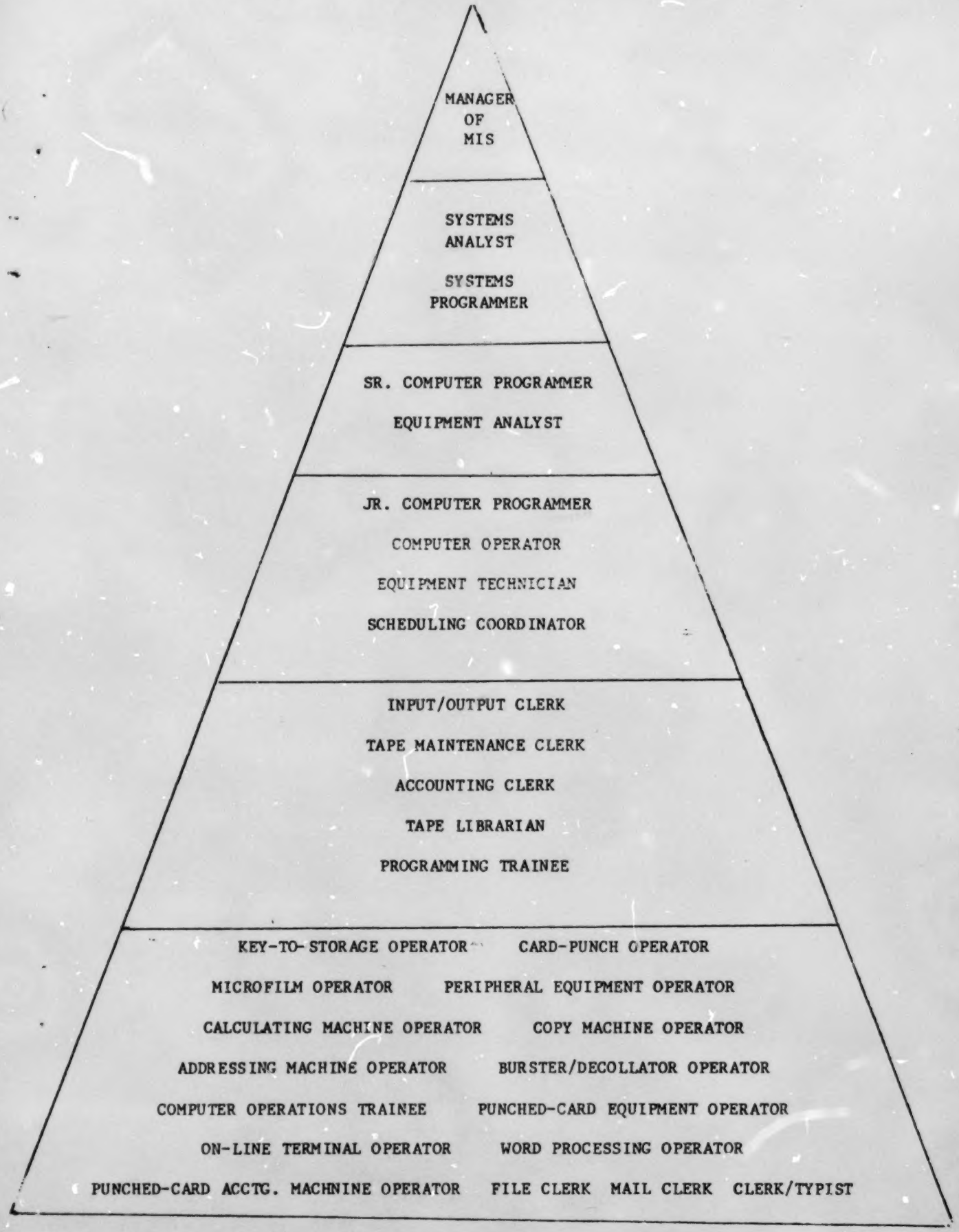
LIBRARIAN: Responsible for the control and maintenance of the on-line and off-line files and programs stored on cards, tapes, or disks. Transferring backup files, purging old files, and periodic cleaning of magnetic tapes and disks.

COMPUTER OPERATOR: Setting up the equipment for particular jobs and mounting and removing tapes or disks as needed. Identifying operational problems, making appropriate corrective action, and maintaining operating records.

DATA-ENTRY OPERATOR: Transcribing data into a form suitable for computer processing.

A FUNCTIONAL ORGANIZATIONAL STRUCTURE FOR A COMPUTER SERVICES DEPARTMENT





A DATA PROCESSING CAREER PYRAMID

SALARIES IN BUSINESS DATA PROCESSING

TYPICAL JOB TITLE	AVERAGE YEARS EXPERIENCE	AVERAGE U.S. SALARIES	SALARY CHANGE FROM MID '79
MIS Director	14.3	$41,450	+ 10.9%
Data Base Manager	8.9	$33,800	+ 21.0%
Systems/Software Programmer Manager	6.8	$33,150	+ 17.1%
Systems Analyst	5.6	$23,800	+ 15.5%
Software Programmer	4.1	$24,900	+ 15.0%
EDP Auditors	3.1	$24,600	+ 15.1%
Telecommunications Personnel	2.6	$24,500	+ 12.5%
Applications Programmer	3.5	$21,750	+ 16.6%
Entry-Level, M.B.A.	0	$19,100	+ 16.1%
Entry-Level, B.S.	0	$16,050	+ 17.5%

Source: Fox-Morris Mid-80 U.S. Data Processing Job/Salary Survey.

Development

DEVELOPING THE DATA PROCESSING PROGRAM

A number of steps should be taken in preparing to implement a data processing program. Information should be gathered from within the business education department, from within the high school, and from the surrounding business community. The considerations are described below.

1. Survey the Employment Community

   A survey of the employment community should be made to determine the data processing personnel needs within area businesses. (A 50 mile radius is recommended.) A questionnaire should be developed and sent to area businesses. The information gathered should include: the number of data processing jobs available, the number of businesses requesting that employees have a knowledge of data processing, the types of computer hardware being used, future projections regarding hardware and personnel requirements, and so on.

2. Survey the Student Body

   The students within the high school should be surveyed. The purpose of this survey would be to determine the amount of student interest course offerings in data processing would generate. All students within the school would be asked to indicate their interest in enrolling in a proposed data processing class. The survey results should provide information regarding tentative enrollments.

3. Evaluate Faculty Qualifications

   A qualified data processing teacher, committed to the development of data processing curriculum is essential to the success of a new program. In setting up a program, it is important to look at the data processing qualifications of the business education faculty. Although faculty members may be lacking data processing background initially, they should not be afraid to get involved. Present business education teachers must be encouraged to update their education and work experience in business data processing. Improved knowledge of data processing concepts and skills will also help teachers integrate data processing into existing business education courses.

   Since the field of data processing is continually changing, teachers should be provided with in-service programs and workshops dealing with current data processing equipment, procedures, and issues and trends in data processing education.

4. Determine the Curriculum

Once the need for a data processing program has been established and faculty qualifications have been considered, curriculum decisions can be made. Decisions should be made regarding:

1. the course objectives (vocational or exploratory)
2. the course content
3. the resources needed, e.i. equipment, materials, etc.
4. the length of the data processing course--one semester or a full year
5. the maximum number of students per section

Information on the curricular material appropriate for each of the data processing courses may be found in the course content section.

5. Determine the Course Prerequisites

It may be necessary to establish prerequisites for students entering introductory data processing. Generally, there are no standard prerequisites. It is highly recommended, however, that a course in keyboarding or typewriting be taken prior to enrolling in Introduction to Data Processing. A course in accounting would also be beneficial. The final decision regarding prerequisites should be made by each school based on its program, enrollments, and facilities.

6. Selection of Equipment

Equipment is essential for any data processing program. Many alternatives exist in providing students with hands-on experience. Up-to-date equipment should be located within the business education area, however, it may be necessary to share equipment with other departments. Major equipment items to consider purchasing or leasing include data entry machines, microcomputers, and minicomputer systems. The use of time-sharing terminals or batch processing could be arranged through CESA Districts, post-secondary schools, or local businesses. It should be noted that the course could be taught without equipment; however, certainly, the use of some type of equipment is most desirable.

7. Selection of a Textbook

After the data processing course content has been determined, an appropriate textbook(s) should be selected.

There are many textbooks available from a wide variety of publishers. It is important to determine a student profile and base your textbook selection on course content and also on the type of student who will is enrolled. The reading level of the text should be appropriate for the average students. Reading level can be determined by utilizing one of the many tests available such as: the Powell Procedure, the Fog Index,

the Flesch, or others that may be available. Other factors to be considered in selecting a textbook include the organization, the appropriateness of material, the accuracy of information, the supplementary materials, the types of student activities, the chapter assignments, and the student appeal factors such as color, size of print, and quality of pictures.

Before selecting a textbook, prospective data processing teachers should talk with experienced data processing teachers from other school districts. Often, views on textbooks and supplementary materials from experienced teachers can be very helpful. Most publishers will provide examination copies upon request.

8. Present Proposal to the Administration

A proposal should be written and presented to the appropriate administrators in your school. Ultimately, it should be presented for adoption by the school board. The proposal should include the results of community and student surveys, objectives, justification for the course, course outline, personnel, equipment, and costs. Proposal guides and samples are included in the appendix, Page 51. The proposal must follow the established procedures in the school district.

After approval, be sure a brief course description is included in the school handbook or registration materials. Also, orient students, guidance counselors, and other faculty members to the new course offering.

9. Evaluate the Program

It is necessary that the existing data processing program be evaluated and updated on a regular basis. Student feedback in the form of course evaluations, reactions from an advisory committee, and follow-up studies of graduates should be included in the evaluation process. Based on these, decisions can be made to expand by offering more sections, and/or initiating an additional course.

10. Advisory Committee:

The advisory committee for the data processing program may be a separate committee or it could conceivably be a part of the existing business education advisory committee. The advisory committee should consist of area employers, data processing personnel, civic leaders, and representatives of technical institutes, colleges, and universities in which high school graduates might enroll. Such members serve without pay as interested citizens and provide advice and assistance to the school. The committee normally consists of 9 members (but may range from 6 to 12), who generally serve for a 1-to-3 year period.

The committee assists in surveying and defining the need for data processing personnel; the knowledge and skills they will require; employment opportunities; available student population; curriculum, faculty, facilities and equipment; the extent of community support, and cost and financing of the program. When the studies indicate that a program should be initiated, the committee's help in planning and implementing is vital.

Frequently, the committee helps school district administrators obtain local funds, and State and Federal support for the program. The committee can alsc help assure careful articulation of the high school's program with those offered at area institutions of higher education where its graduates are likely to enroll for additional education and training. In addition, when the graduates seek employment, the committee can aid both in placing them in jobs and in evaluating their work performance. Such evaluations often result in minor modifications which will more closely relate the program to employment or college requirements.

Integration

INTEGRATING DATA PROCESSING INTO EXISTING BUSINESS EDUCATION CLASSES

Because of the importance of data processing concepts in society today and its applications in so many business areas, it seems necessary that all business students be introduced to data processing concepts. Therefore, all business education teachers should incorporate some data processing into their existing courses, even if a separate course in data processing is offered.

On the following pages you will find many examples of suggested student learning activities involving data processing which could be incorporated into existing business education courses. These suggestions are a starting point; expand and adapt them to meet your own particular needs.

ACCOUNTING

Suggested Student Learning Activities:

1. Start a collection of newspaper and magazine articles concerning current uses of data processing for accounting applications.

2. Interview the manager or sole proprietor of a small business that utilizes a computer system. Write a brief description of the computer applications in that business.

3. Invite a data processing manager and an accounting manager to explain to the class careers and employment requirements for each department.

4. From an accounting department, collect and examine source documents (e.g., sales tickets, purchase orders, time cards) and trace the steps for each from data entry to report generation.

5. Interview a local banker and/or collect brochures to determine computer applications of the following:

    a. automated teller machine (ATM)
    b. automated clearinghouse (ACH)
    c. magnetic-ink character recognition (MICR)
    d. electronic funds transfer system (EFTS)

6. Visit a computer store to identify ways in which microcomputers could be used for accounting applications, such as general ledger payroll, accounts receivable, accounts payable, and inventory.

7. Visit a computer store to identify ways in which individuals may use microcomputers for personal recordkeeping.

8. From an introductory data processing text or magazines, prepare a list of characteristics of manual, mechanical, unit record, and electronic data processing systems.

9. From a data processing textbook, obtain and examine a listing of a BASIC or COBOL program written for an accounting application (e.g., payroll, accounts receivable). Identify statements within the program that relate to the solution.

10. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, and to observe data processing professionals at work.

11. Invite an accounting supervisor to explain to the class how records are created, stored, and retrieved in a manual and an electronic system.

12. If equipment is available, run programs that simplify the manual procedures of journalizing and posting; bank reconciliation; calculating interest, depreciation, and payroll. These activities will allow the student to observe the computer's speed and accuracy on repetitive tasks.

13. When studying income taxes, explore the data processing steps involved in processing the return.

Accounting Continued

14. Research the files kept by the Social Security Administration. Consider why numbers are used for identification.

15. Interview an accountant or the manager of a small business that utilizes a computer system. Write a brief description of the computer applications in recordkeeping for that business.

16. Invite a manager of a retail store to explain the following concepts that relate to recordkeeping:

    a. methods for storing records
    b. procedures for updating records
    c. measures for protecting records
    d. general advantages/disadvantages of computers

17. Have students compile a list of as many input and output devices as they can find.

18. From various data processing magazines and vendor brochures, have students prepare a picture collage of input and output devices.

19. Have students prepare word games (crossword puzzles, word-finders, etc.) using data processing terminology.

20. Flowchart an activity that the student is very familiar with (baking a cake, brushing teeth, making a sandwich, etc.).

21. Develop a slide presentation on common computer applications that students encounter (point-of-sale terminals, automated tellers, optical scanners at grocery check-out, ticketrons, etc.)

22. Use the computer in conjunction with simulations to prepare payroll, generate reports, etc.

23. Bring in samples of canceled checks and trace the steps in their flow through the banking system.

BUSINESS COMMUNICATIONS

Suggested Student Learning Activities:

1. Obtain, identify, and evaluate computer-prepared form letters (e.g., sales collection letters).

2. Interview a programmer to determine the importance of spelling and syntax. (Example: imput for input)

3. Interview a data processing or word processing manager to determine the importance of written communication in his/her work.

4. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, and to discuss with data processing professionals the types of writing skills needed by them to perform effectively and efficiently.

5. Summarize in report form the information contained on a computer print-out of financial statements.

6. Compose and dictate a letter to computer manufacturers and vendors requesting brochures on their data processing/word processing equipment.

7. Examine "personalized" computer-generated letters and discuss your reactions to their appeal.

8. Have the students use computer-assisted instruction to upgrade and reinforce their skills in spelling, punctuation, and grammar.

BUSINESS LAW

Suggested Student Learning Activities:

1. Visit a law firm to determine the use of computers in legal office applications.

2. Collect articles describing computer-related fraud.

3. Visit a local police department to determine its use of computers.

4. Invite an attorney as a guest speaker to discuss recently enacted legislation dealing with privacy laws, computer crime, and consumer protection.

5. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, to observe data processing professionals at work, and to discuss procedures used by the company to prevent computer-related fraud.

6. Investigate any cases that involve computer mistakes, releasing computer mailing lists, computer crimes, etc.

BUSINESS MATH

Suggested Student Learning Activities:

1. Practice arithmetic exercises involving the conversion of binary and hexadecimal numbers to decimal numbers.

2. Practice addition and subtraction exercises in binary and hexadecimal number systems.

3. Practice converting arithmetic expressions into computer acceptable format (e.g., a ÷ b = c to c = a/b).

4. Have a representative from a computer store demonstrate to the class how microcomputers can be used in solving math problems.

5. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, and to observe data processing professionals at work.

6. If you have access to prepared programs on a computer, let the student play number games.

7. Let math students use the computer to solve business math problems (interest, depreciation, payroll, percentages, etc.).

8. Have the students use computer-assisted instruction as a tutorial device to strengthen some of their math skills.

9. Have students compound interest for 3-4 months, then demonstrate the same problem on the computer to see its speed and accuracy.

Suggested Student Learning Activities:

1. From an introductory data processing text, prepare a list of major developments in the history of data processing and how they have affected the way business is conducted in the United States.

2. From an introductory data processing text, prepare a list of characteristics of manual, mechanical, unit record, and electronic data processing systems.

3. Start a collection of newspaper and magazine articles concerning current uses of data processing.

4. Interview the manager of a small business which utilizes a computer system. Write a brief description of the computer applications in that business.

5. Invite a manager of a hotel/motel to discuss applications of the computer in the hospitality industry.

6. Invite an airline representative to discuss class applications of the computer for airlines.

7. Interview a local banker to determine how the following are used in the banking industry:

    a. automated teller machine (ATM)
    b. automated clearinghouse (ACH)
    c. magnetic-ink character recognition (MICR)
    d. electronic funds transfer system (EFTS)

8. Interview a manager of a retail store to determine how the following are used in the retailing industry:

    a. point-of-sale (POS)
    b. universal product code (UPC)

9. Visit a computer store to identify ways microcomputers are used in business and for individual needs.

10. Write to vendors (e.g., IBM, Honeywell) requesting brochures depicting data processing equipment they manufacture. Using these brochures, prepare a bulletin board display.

11. Invite a personnel manager who deals with data processing positions to explain employment requirements and careers in data processing.

12. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, and to observe data processing professionals at work.

13. Read a magazine article on data processing and write a summary.

14. Identify and write a brief description of careers in data processing/ word processing.

15. If equipment is available, students may play games and run programs on banking, personal finance, stock market, etc.

MANAGEMENT AND/OR MARKETING

Suggested Student Learning Activities:

1. From an introductory data processing text, prepare a list of major developments in the history of data processing and its impact upon management.

2. From an introductory data processing text, prepare a list of characteristics of manual, mechanical, unit record, and electronic data processing systems. Discuss how the development of data processing systems has affected management decisions, problems, and activities.

3. Through an examination of a data processing textbook, make a list of commonly used input/output devices. List characteristics of each and how each device can be used to improve the efficiency of a manager.

4. Invite an office manager to explain how computer systems have affected the work of managers. Inquire about the role of the manager in designing programs for his company.

5. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, to observe data processing professionals at work, and to determine how company managers use the computer facilities.

6. Write to vendors (IBM, NCR, etc.) requesting brochures for cash register systems and inventory controls depicting data processing equipment they manufacture. Using these brochures, prepare a bulletin board display.

7. Tour a manufacturing plant to determine uses of the computer for production and distribution. (e.g., textile manufacturer, cigarette manufacturer, automated warehouse). Ask questions about the effect of the computer on the company's profits.

8. Interview a local banker and/or collect brochures to determine computer applications of the following:

    a. automated teller machine (ATM)
    b. automated clearinghouse (ACH)
    c. magnetic ink character recognition (MICR)
    d. electronic funds transfer system (EFTS)
    e. point-of-sale terminals (POS)

9. From a data processing textbook, obtain data about the decreasing cost of computer hardware (and the increasing cost of computer software). Identify and list the economic implications for vendors, prospective users, and other segments of the society.

10. Identify the economic effects of the computer on productivitiy, corporate profits, and the work force in a free enterprise system.

11. Develop a program to calculate mark-ups at varying rates for the various products in your line.

Management and/or Marketing Continued

12. Contact a marketing agency to ask about the types of market surveys and opinion polls they use. What role does the computer play in this research?

13. Write to five different places (Spencer, Current Stationery, etc.) and have them enter your name on their computer mailing list. Compare correspondence, brochures, etc., received from them with other students.

14. Collect and bring in samples of junk mail that your parents receive as a result of being on computer mailing lists. Look at ways in which companies have tried to personalize this mail. Relate experiences parents may have had or their difficuties getting off some mailing lists.

15. Contact local businesses to determine the types of sales reports that are generated by their computers.

16. Visit a local credit bureau. What role does the computer play in their recordkeeping and credit reporting activities?

17. Use the computer for a management decision-making simulation.

OFFICE PROCEDURES (CLERICAL, SECRETARIAL)

Suggested Student Learning Activities:

1. Interview an office manager to determine the relationship of office functions between support staff and the data processing department.

2. Invite a payroll clerk to the class to explain how the use of computers has changed the responsibilities and tasks of clerks.

3. Arrange to visit a computer installation to identify its hardware, to view business applications in operation, and to observe data processing professionals at work.

4. Invite a word processing manager as a guest speaker to explain the word processing applications used in the the company.

5. Invite an administrative manager to explain employment requirements and careers in administrative support occupations that require a knowledge of data processing/word processing.

6. Visit a firm that uses word processing computer equipment to learn how records are stored and retrieved in an electronic system.

7. Have the students use computer-assisted instruction to upgrade and reinforce their skills in math, spelling, punctuation, and grammar. (Many prepared programs are available.)

8. If data processing/word processing equipment is not available, the techniques of keying information into a system can be simulated by timing students as they type a letter, backspacing and striking over errors as they go.

9. Have the office procedures students work with the data processing students to keyboard their programs. (enter on computer terminal, keypunch the cards, etc.)

10. Compose and dictate a letter to computer manufacturers and vendors requesting brochures on their data processing/word processing equipment.

11. Use the computer in conjunction with simulations to generate orders coming in, prepare reports, to simulate poor-quality transcription tapes, etc.

12. Use the computer to simulate poor-quality transcription tapes by asking the student to type in missing words of a letter. Have computer print out letter after all responses have been made.

13. Some time-sharing terminals have textbook readability programs. Students could type out the 100 words from textbooks to obtain reading level.

SHORTHAND

Suggested Student Learning Activities:

1. Practice reading correctly and writing accurately selected data processing/word processing terms as assigned by your teacher.

2. Interview a secretary who is working in a data processing environment to determine the data processing terms frequently used in dictation by personnel in that department.

3. Dictate letters to students on data processing/word processing topics and transcribe them.

4. Invite a data processing/word processing manager to the class to dictate sample letters sent from their office.

5. Use the computer for skill-building in the areas of spelling, punctuation, and vocabulary.

6. To simulate poor-quality transcription, use the terminal to type missing words of a letter. Have the computer print out the letter after all responses have been made.

7. Investigate use of computers in machine transcription.

Suggested Student Learning Activities:

1. Prepare a bulletin board containing pictures/diagrams of data-entry devices (e.g., keypunch, data recorder, CRT, teletype) which require a keyboarding skill.

2. Invite a data-entry supervisor to explain worker characteristics, training, and education needed for data-entry positions.

3. Prepare a bulletin board of want ads from local newspapers listing jobs available in data entry.

4. Type a list of local businesses that use keyboard devices for data entry.

5. Compose and type a letter to computer manufacturers and vendors requesting brochures on their word processing and data processing equipment.

6. Type timed writings on careers in data processing and word processing.

7. If equipment is available, allow the students to type in a short program or responses to a program to become exposed to how it works.

8. Proofread several paragraphs which include word processing/data processing applications, concepts, or vocabulary.

9. Take a computer printout of names and addresses written in paragraph style and rearrange and type them as a table.

10. Use computers to evaluate typing speed and accuracy.

11. Use computer-assisted instruction in skill building.

Curriculum

CURRICULUM

The following course outlines should serve as a guide for developing your business processing curriculum. Equipment is necessary for all courses.

For the Introduction to Business Data Processing course, two different approaches are given:

1. Example A is a more general outline.

2. Example B is the same content but with greater detail.

The Advanced Data Processing outline covers the basic concepts necessary for a beginning course in business computer programming. This course could be repeated for additional units or semesters by using a different lanuguage.

INTRODUCTION TO BUSINESS DATA PROCESSING

EXAMPLE A

I. GENERAL INTRODUCTION AND CAREER INFORMATION

- A. Current Computer Applications in Society
- B. Job Descriptions--Data Preparation, Operators, Programmers, and Analyst/Manager
- C. Post-Secondary Schools Offering Data Processing Programs
- D. Salary Information (Annual Surveys in Infosystems and Datamation Magazines)

II. HISTORY AND DEVELOPMENT OF DATA PROCESSING

- A. History of Manual and Mechanical Data Processing
- B. Data Processing Cycle--Recording, Classifying, Sorting, Calculating, Sorting, Summarizing, Communicating, and Storing
- C. Generations of Computers

III. INTRODUCTION TO ELECTRONIC DATA PROCESSING USING COMPUTERS

- A. Hardware and Software
  1. Define a computer
  2. Parts of a computer system--input, processing, output
  3. Types of computer systems--micro, mini, large, time-sharing, service bureaus
- B. Input/Output Design
  1. Design of the 80-column card
  2. Hollerith code
  3. Formatting with files, records, fields, and characters
  4. EBCDIC code
  5. BCD code
  6. Input concepts using mark-sense cards, paper tape, magnetic tape
- C. Input/Output Equipment
  1. Card related
  2. Terminals--CRT, hard copy, POS, etc.
  3. Magnetic devices--floppy disk, magnetic tape and disk
  4. Printers--impact and nonimpact
  5. Other mediums--microfilm, communications, word processing
- D. Expand on Hardware and Software
  1. Review of computer system parts in more detail
  2. Review the types of computer systems in more detail
  3. Data base concepts
  4. Word processing concepts
  5. Data communication concepts

IV. PROBLEM SOLVING

- A. Flowcharting
- B. Pseudocode
- C. Hierarchy Charts

V. INTRODUCTION TO PROGRAMMING

A. Introduction to Programming
   1. Examples of statements--not necessarily a specific language
   2. Classify statements--arithmetic, data movement, control/logic, input/output
   3. Write a program
      a. Required language statements
      b. Step through a class example--follow the entire problem solving process

B. Types of Languages
   1. Machine language
   2. Assembler language
   3. High level languages--BASIC, FORTRAN, COBOL, RPG-II, PASCAL, etc.
      a. No technical details
      b. Give sample illustration

VI. EFFECT OF DATA PROCESSING ON INDIVIDUALS AND GROUPS

A. Computer Ethics
B. Computer Privacy

VII. SPEAKERS AND FIELD TRIPS TO COMPUTER CENTERS

INTRODUCTION TO BUSINESS DATA PROCESSING

EXAMPLE B

I. INTRODUCTION

- A. Importance of Data Processing
- B. Types of Data Processing--Unit Record, Electronic
- C. Data Processing Cycle
- D. Applications in the Future
- E. Career Opportunities

II. COMPUTERS IN SOCIETY

- A. Business--Electronic Office
- B. Education
- C. The Home
- D. Everyday Life
  1. Privacy and personalization
  2. Fraud
  3. Government records: police, social security, taxes, etc.
  4. Movies, literature, and the arts
- E. Artificial Intelligence
- F. Robots
- G. Effects on Employment

III. COMPUTER APPLICATIONS IN BUSINESS

- A. Payroll
- B. Ordering, Processing, Inventory, Sales Analysis
- C. Billing, Accounts Receivable, Customer Service
- D. Distinction between Data Processing and Management Information
- E. Security of Equipment and Data

IV. CAREERS IN DATA PROCESSING

- A. Location of Data Processing Department within the Organization Chart
- B. Data Processing Department--Separation of Functions
  1. Operations--keypunch operator, computer operator, librarian, data clerk
  2. Programming
  3. Systems
- C. Job Descriptions and Salary Levels
- D. Related Information Services
  1. Word processing
  2. Records management
  3. Office management

V. DATA PREPARATION

- A. Cards and the Unit-Record Concept
  1. 80-column card--characteristics, Hollerith code
  2. 96-column card--BCD Code
  3. Data fields--alphabetic, numeric, and alphanumeric
  4. Documentation
  5. Verification
  6. Other types of cards--dual purpose, document, stub, mark-sense, etc.

DATA PREPARATION cont.

B. Other Media
   1. Paper tape
   2. Magnetic tape
   3. Magnetic disk
   4. Floppy disk
   5. Character recognition devices--MICR,OCR, optical bar code, etc.

C. Comparison of Media

VI. INPUT/OUTPUT DEVICES

A. Card Oriented Devices--Card Reader, Card Punch, Card Reader/Punch.

B. Terminals
   1. CRT (cathode-ray tube)
   2. Hardcopy
   3. Point-of-sale
   4. Key entry
   5. Console
   6. Video display
   7. Intelligent terminals
   8. Light pen terminals
   9. Gas plasma terminals

C. Magnetic Devices
   1. Floppy disk drives
   2. Magnetic tape unit
   3. Magnetic disk unit

D. Output Devices
   1. Printers
      a. Impact and dot matrix
      b. Laser printers
      c. Ink jet
   2. Computer output microfilm

E. Elements of Data Communications

F. Concepts of Distributed Data Processing

G. Concepts of Word Processing

H. Concepts of Tele-Communications

VII. COMPUTER SYSTEMS CONCEPTS

A. Computer Components
   1. Hardware
   2. Software
   3. Central processing unit
      a. Control unit
      b. Arithmetic-logic unit
      c. Primary storage
   4. Secondary storage

B. Size and Selection of Computer System
   1. Microcomputers
   2. Minicomputers
   3. Large computers
   4. Lease or purchase options

COMPUTER SYSTEMS CONCEPTS cont.

C. Representation of Data in Storage
   1. Binary
   2. BCD
   3. EBCDIC
   4. ASCII
   5. Numbering systems

D. Types of Primary Storage
   1. Magnetic core
   2. Semi-conductors
   3. Memory bubbles
   4. Virtual storage and overlapping processing

E. Types of Computer Processing
   1. On-line/off-line processing
   2. Real-time processing
   3. Time-sharing systems
   4. Distributed processing
   5. Service bureaus

VIII. PROBLEM-SOLVING TECHNIQUES

A. Steps of Problem Solving
   1. Analysis of the problem
   2. Plan a solution
   3. Code
   4. Test and debug
   5. Documentation

B. Tools of Problem Solving
   1. Flowcharting
      a. Symbols and usage
      b. Types of flowcharting
   2. Decision tables
   3. Hierarchy charts
   4. Pseudocode charts

IX. COMPUTER PROGRAMMING

A. Introduction to Programming
   1. Examples of statements--not necessarily a specific language
   2. Classify statements--arithmetic, data movement, control/logic, input/output
   3. Write a program
      a. Required language statements
      b. Step through a class example--follow the entire problem solving process

B. Types of Languages
   1. Machine language
   2. Assembler language
   3. High level languages--BASIC, FORTRAN, COBOL, RPG-II, PASCAL, etc.
      a. No technical details
      b. Give sample illustrations

Teacher Certification

TEACHER CERTIFICATION

Of major importance to all teachers is the fact that they have to be certified. The three basic types of certification in Business Education are:

1. Business Education--to teach junior and senior high school business education courses.

2. Secondary Vocational Business Education--to teach occupational preparation programs and all reimbursable business education programs.

3. Vocational, Technical, and Adult Education--to teach at the post-secondary vocational technical level.

The following is a summary of the requirements and procedures for obtaining and renewing these particular licenses.

I. Business Education Certification

A. Requirements

Certification in business education is granted on the basis of the completion of a college/university approved program of teacher education and upon the State Department of Public Instruction's receipt of a recommendation to teach from the certifying officer at the preparing institution. An applicant must have satisfied all requirements of the preparing institution as well as those listed below in order to qualifty for certification to teach in Wisconsin.

Initial Certification

Three-year licenses will be granted to recommended degree-holding graduates of accredited degree-granting colleges or universities in business education.

1. A major in business education shall consist of a minimum of 34 semester credits.

2. A minor in data processing shall consist of a minimum of 22 semester credits exclusive of methods.

3. The professional sequence shall include the areas of educational psychology, child growth and development, curriculum, methods, teaching of reading, and student teaching.

B. Procedure for Obtaining Business Education Certification

Fill out the Wisconsin Department of Public Instruction Credential Application Form and submit it along with $30 to:

Teacher Certification
Department of Public Instruction
125 South Webster Street
Madison, WI 53702
608-266-1027

C. Additional Sources of Information

Contact:
Ms. Judith S. Byfield
Supervisor of Business Education
125 South Webster Street
Madison, WI 53702
608-266-2348

II. Secondary Vocational Business Education Certification

A. Requirements

1. Initial Vocational Certification

A three-year license will be granted to an individual meeting the requirements of (a), (b), and (c) as indicated below.

A one-year provisional license will be granted to an individual who fulfills the requirement of items (1) and either (b) or at least 1,500 hours of items (c). Progress must be made toward removal of deficiencies before a one-year provisional license can be renewed. Progress is made by completing the course required in item (b) or by completing at least 95 hours of business and/or office related work experience or its equivalent if there is a deficiency under item (c). If an applicant has a deficiency in both items (b) and (c), he/she can be eligible for renewal upon either taking the course or working 95 hours, although he/she is encouraged to take the course required by item (b) as soon as possible. A provisional license will be renewed as long as an applicant's application documents that progress has been made toward removal of deficiencies. The request for temporary certification must be made by the district administrator using form P.I. 1615.

These requirements are:

a. Completion of a 34-semester hour major in business education. An individual having a business education major which qualifies him/her to teach only basic business subjects is not eligible for vocational certification.

b. Successful completion of an approved course in the principles, issues, orientation, or philosophy of vocational education. This course is available in these University of Wisconsin schools: Eau Claire, Madison, River Falls, Stevens Point, Stout, Superior, and Whitewater.

Graduate credits earned in this course cannot be applied to a work experience deficiency as in the third paragraph below.

c. Completion of 2,000 hours (equivalent of one full year) of occupation experiences as a paid employee on a job similar in nature to the one his/her students will seek upon graduation.

This occupational experience should have been completed during the ten-year period preceding the effective date of initial certification.

Up to two-fifths or 800 hours of this occupational experience may be secured by earning university graduate credits in appropriate technial business subjects or workshops. One graduate credit would equal 95 clock hours of busness and/or office related occuptional experience under this provison. One clock hour of a Department of Public Instruction approved workshop experience can count up to three hours of occupational experience. If you have any questions about courses or workshops, contact Judith Byfield or Michael Tokheim at the Department of Public Instruction.

Up to three hours of occupational experience credit can also be earned for each hour of business and/or office-related occupational experience gained while enrolled in a Department of Public Instruction approved, university-coordinated, occupational experience program. The University of Wisconsin campuses at Eau Claire, Madison, Superior, and Whitewater offer this program. The total number of hours eligible for multiple of three is left to the discretion of the coordinator (instructor/professor) of the directed occupational program and must be documented by the student and verified by the coordinator. Graduate credits earned in this program are not eligible for the 95 clock hours of occupation experience as outlined in the above paragraph, as this would be equivalent to double counting.

2. Five-Year Certification

a. After completing three years of successful teaching in a position requiring a vocational business and office education certificate and upon completion of three semester hours of appropriate college credit (technical vocational content) since the application date his/her previously approved vocational license, a teacher is eligible for a five-year certificate.

1. Ninety-five clock hours of paid business and/or office related occupational experience may be substituted for each collegiate credit required for renewal.

2. One clock hour of DPI approved workshop experience can count as up to three clock hours of occupational experience.

3. Continuing education units in a technical field of business and office occupations will be considered as occupational experience. Up to three hours of occupational experience can be earned for each clock hour of instruction while enrolled in a continuing education units course.

4. Attendance at the annual Wisconsin Business Education Association Convention is considered as one hour of appropriate collegiate credit for renewal purposes if the applicant documents that he participated in the entire convention. Attendance at the WBEA convention cannot comprise more than half of the credits required for renewal, however.

5. Applications cannot be processed until the applicant completes the required course work or occupational experience.

Equipment & Facilities

EQUIPMENT

It is highly recommended that equipment be obtained to add realism and hands-on experience to your units and courses in data processing.

When you start looking at available equipment, consider purchasing or leasing a microcomputer or a minicomputer; working out a time-sharing plan with a local business, post-secondary school, or CESA; or using a service bureau. Consider federal funding sources that are currently available.

Option 1: Purchase Microcomputer System

Cost: generally $500 to $5,000
Memory Size: limited (usually 4K-64K)
Often need adaptation to add on I/O devices (interface required)
Programming Languages: limited (usually BASIC)

Option 2: Purchase or Lease Minicomputer

Cost: $4,000 to $100,000/leasing terms available
Memory Size: 8K-256K
Fairly easy to add on I/O devices and expand memory
Programming Languages: multiple languages are usually available

Option 3: Time-Sharing

Cost: monthly user fee plus telephone line fee
Memory Size: depends on host computer and contract terms
Need a terminal (recommend that it have printing capabilities)
Programming Languages: depends on host computer.

Option 4: Service Bureau

Cost: based on computer time and cost of supplies
Memory Size: depends on service bureau computer system
Data entry equipment usually needed.
Programming Language: depends on service bureau computer

EQUIPMENT AND FACILITY CONSIDERATIONS

1. Do you need controlled climate for the computer system?
2. Do you have adequate electrical supplies?
3. Is remodeling necessary to facilitate your computer installation?
4. Do you have a secure area for equipment?
5. How readily available is servicing?
6. Is a service contract available?
7. Is dealer installation required? If so, is it included in the package cost?
8. Do you have enough floor and table space to accommodate the equipment?
9. How soon is delivery guaranteed?
10. What software is available and affordable, as well as appropriate, for your computer?
11. What are the warranty terms?
12. Are there expansion capabilities on the initial system?
13. Have you visited existing data processing facilities in other schools for comparisons and advice?
14. Will you be able to share software with other schools or departments?
15. Is there adequate memory (recommended 16K minimum) and can additional memory be added?

Educational Resources

BOOK PUBLISHERS

Addison-Wesley Publishing Co., Inc.
Reading, MA 01867

Anaheim Publishing Co.
1120 East Ash
Fullerton, CA 92631

W. C. Brown Co. Publishers
2460 Kemper Blvd.
Dubuque, IA 52001

Glencoe Publishing Co.
17337 Ventura Blvd.
Encino, CA 91316

Gregg Division
McGraw-Hill Book Company
Manchester Road
Manchester, MO 63011

Harcourt Brace Javanovich, Inc.
757 3rd Avenue
New York, NY 10017

Houghton Mifflin Co.
1900 South Batavia Ave.
Geneva, IL 60134

Richard D. Irwin, Inc.
Homewood, IL 60430

McGraw-Hill Book Company
(College Division)
Manchester Road
Manchester, MO 63011

Prentice-Hall, Inc.
Englewood Cliffs, NJ 07632

Prindle, Weber, and Schmidt
Statler Office Building
20 Providence Street
Boston, MA 02116

Reston Publishing Co.
Reston, VA 22090

H. M. Rowe Company
624 North Gilmore Street
Baltimore, MD 21217

SRA
Science Research Associates, Inc.
407 South Main Street
Mount Prospect, IL 60056

Southwestern Publishing Co.
355 Conde Street
West Chicago, IL 60185

Sybex Inc.
2020 Milvia Street
Berkeley, CA 94704

Wadsworth Publishing Co.
Belmont, CA 94002

West Publishing Company
50 West Kellogg Boulevard
P.O. Box 3526
St. Paul, MN 55165

John Wiley & Sons
605 Third Avenue
New York, NY 10016

PERIODICALS

Byte*
Byte Publications, Inc.
70 Main Street
Peterborough, NH 03458

Computer Decisions
Hayden Publishing Co. Inc.
P.O. Box 13802
Philadelphia, PA 19101

Computerworld
797 Washington Street
Newton, MN 02160

Creative Computing*
P.O. Box 789-M
Morristown, NJ 07960

Data Processor*
International Businesss Machines Corp.
112 East Post Road
White Plains, NY 10601

Datamation*
1301 South Grove Avenue
Barrington, IL 60010

Infosystems*
Hitchcock Publishing Co.
Hitchcock Building
Wheaton, IL 60187

Journal of Data Education
Society of Data Educators
983 Fair Meadow Road
Memphis, TN 38117

Journal of Data Management
Data Processing Management Society
505 Busse Highway
Park Ridge, IL 60068

80 Microcomputing
P.O. Box 997
Farmingdale, NY 11737

Mini-Micro Systems*
Cahners Publishing Company
221 Columbus Avenue
Boston, MA 02116

Office Product News*
645 Steward Avenue
Garden City, NY 11530

The Office*
1200 Summer Street
Standford, CN 06904

Personal Computing*
Benwill Publishing Corporation
1050 Commonwealth Avenue
Boston, MA 02215

Software Age*
2211 Fordem Avenue
Madison, WI 53701

Telecommunications
610 Washington Street
Dedham, MA 02026

T.H.E. Journal*
P.O. Box 992
Acton, MA 01720

*Denotes free to qualified subscribers.
NOTE: Contact vendors for other possible publications.

AUDIO VISUAL SUPPLIERS

Audio-Visual Center
Stewart Center
Purdue University
West Lafayette, IN 47907

Audio Visual Library Service
University of Minnesota
3300 University Avenue, S. E.
Minneapolis, MN 55414

Bank Administration Institute
303 South Northwest Highway
P.O. Box 500
Park Ridge, IL 60068

Business Education Films
7320 20th Avenue
Brooklyn, NY 11214

Control Data Corporation
8100 34th Avenue
Box 0
Minneapolis, MN 55440

Coronet Instructional Media
65 East South Water Street
Chicago, IL 60601

Educational Activities, Inc.
P.O. Box 392
Freeport, NY 11520

John Hall Film Service
2718 West Atkinson Avenue
Milwaukee, 53209

Ideal Pictures Film Libraries
4431 West North Avenue
Milwaukee, WI 53208

Indiana University
Audio-Visual Center
Bloomington, IN 47401

J. Weston Walch
Box 658
Portland, ME 04014

Modern Talking Picuture Service
2323 New Hyde Park Road
New Hyde Park, NY 11042

NORCACHA
3301 Woman's Club Drive
Suite 141
Raleigh, NC 27612

N.C. Department of Cultural Resources
Division of State Library
Raleigh, NC 27611

ROA Films
1696 North Astor
Milwaukee, WI 53202

South-Western Publishing Co.
5101 Madison Road
Cincinnati, OH 45227

Teaching Aids, Inc.
P.O. Box 3527
Long Beach, CA 90803

The University of Texas
at Austin
Instructional Media Center (VIB)
Drawer W. University Station
Austin, TX 78712

Visual Aids Service
University of Illinois
Champaign, IL 61820

Wisconsin Telephone Co.
722 N. Broadway
Milwaukee, WI 53202

*Be alert to Educational Television Schedule that can be taped for classroom use.

Resource Groups

ORGANIZATIONS

Administrative Managemement Society (AMS)
Willow Grove, PA 19090

American Records Management Association (ARMA)
(Checking on Address)

Association for Computing Machinery (ACM)
1133 Avenue of the Americas
New York, NY 10036

Association for Educational Data Systems (AEDS)
1201 16th Street N.W.
Washington, D.C. 20036

Association of Small Computer Users (ASCU)
75 Manhattan Drive
Boulder, CO 80303

Association for Systems Management (ASM)
24587 Bagley Road
Cleveland, OH 44138

Association for Women in Computing (AWC)
407 Hillmoor Drive
Silver Spring, MD 20901

Data Processing Management Association (DPMA)
505 Busse Hwy.
Park Ridge, IL 60068

Digital Equipment Computer Users Society (DECUS)
One Iron Way
Malboro, MA 01752

International Word Processing Association (IWPA)
Maryland Road
Willow Grove, PA 19090

National Business Education Association (NBEA)
1906 Associaton Drive
Reston, VA 22091

PASCAL User Group (PUG)
University of Minnesota
Computer Center
227 Experimental Engineering Building
208 Southeast Union Street
Minneapolis, MN 55455

Society for Computer Simulation (SCS)
P.O. Box 2228
LaJolla, CA 92038

Society of Data Educators (SDE)
983 Fairmeadow Road
Memphis, TN 38117

Wisconsin Business Education Association (WBEA)
Membership Chairman (1980-81)
2923 48th Street South
Wisconsin Rapids, WI 54494

Word Processing Society, Inc. (WPSI)
P.O. Box 92553
Milwaukee, WI 53202

VOCATIONAL AND TECHNICAL INSTITUTES OFFERING DATA PROCESSING PROGRAMS

VTAE District One
620 West Clairemont Avenue
Eau Claire, WI 54701
(DP, Prep)*

(DP, Oper)*
Madison Area Technical Institute
211 North Carrol Street
Madison, WI 53703
(DP)*

(DP, Oper)*
Waukesha County Technical Institute
800 Main Street
Pewaukee, WI 53072
(DP, Oper)*

Milwaukee, WI 53203
Fox Valley Technical Institute
1825 N. Bluemound Drive
Appleton, WI 54913
(DP)*

2740 West Main Street
North Central Technical Institute
1000 Schofield Avenue
Wausau, WI 54401
(DP)*

Route 3
Moraine Park Technical Institute
235 North National Avenue
Fond Du Lac, WI 54935
(Oper)*

Institute
Mid-State Technical Institute
500 - 32nd Street North
Wisconsin Rapids, WI 54494
(Prep)*

Western Wisconsin Technical Institute
Sixth and Vine Streets
LaCrosse, WI 54601

Gateway Technical Institute
3520 - 30th Avenue
Kenosha, WI 53142

Milwaukee Area Technical Institute
1015 North Sixth Street

(DP, Oper)*

Northeastern Wisconsin Technical Institute

Green Bay, WI 54303
(DP)*

Blackhawk Technical Institute

Prairie Road
Janesville, WI 53545

Wisconsin Indianhead Technical

P.O. Box B
Shell Lake, WI 54871
(Oper)*

* DP - 2-year data processing program
Oper - 1-year computer operator program
Prep - 1-year data preparation program

UW-SYSTEM UNDERGRADUATE COMPUTER-RELATED PROGRAMS

	Eau Claire	Green Bay	LaCrosse	Madison	Milwaukee	Oshkosh	Parkside	Platteville	River Falls	Stevens Point	Stout	Superior	Whitewater
Accounting	●	x	●	●	x	●	x	●	●			●	●
Business Education	■			■						■		■	■
Computer Science	●	c	■	●	●	■		x	x	c	x	x	c
Data Processing	x											●	
Information Systems Analysis, and Design				●	x		x						
Mangement Computer Systems													●
Management Information Systems	●												

● Indicates an undergraduate degree major
■ Indicates an undergraduate degree major plus availability of teacher certification
c Indicates a program leading to teacher certification, but not to an undergraduate degree
x Indicates a minor program only

Funding

CRITERIA FOR FUNDING ELECTRONIC DATA PROCESSING EQUIPMENT

Motivated, individual teachers are often responsible for getting the "wheels in motion" for Title Funding solicitation from the government. If a teacher has a working knowledge of the questions and answers and product specifications, that teacher is ready to tackle solicitation for funding appropriation and the satisfaction of getting a new and worthwhile program for his/her students.

Once a teacher is familiar with the product, it is time to approach his/her school administrator (principal, district superintendent, etc.) and get him/her also interested. Vast sums of money are available for educationally sound programs.

The following information applies to installation and implementation of the microcomputer system. Microcomputers are eligible for funding under:

1. Vocational Education Act of 1963, Part A sub-part 3 as amended in 1976 by P.L. 94.482.

2. Elementary and Secondary Education Act, Title IV-B, (ESEA Title IV-B), P.L. 95.561.

3. Elementary and Secondary Education Act, Title IV-C, (ESEA Title IV-C), 95.561.

Although schools may apply for funds at the federal level and under other acts at the state level we recommend, based upon likelihood of funding and money available, that application be made at the state level under these acts. However, the school administrator is advised that he/she may inquire about other available funds. Simply contact the Department of Education, the Secretary for Education, and the National Institute of Education.

VOCATIONAL EDUCATION ACT -- The objectives are to maintain, extend, and improve vocational education programs and to develop programs in new occupations. The funds under this act may be used for purchase of computers and software programs. The funds are especially for, but not limited to, Vocational Education and Career Training.

ESEA TITLE IV-B -- The objectives are to provide library resources, textbooks and other instructional materials and instructional equipment. Focus is on disadvantaged and bilingual students, also, filling manpower needs and business community involvement. Funds may be used for the purchase of a computer, instructor's curriculum manual, user's manual, individual student manuals, and software programs. The funds are especially for, but not limited to, library resourses.

ESEA TITLE IV-C -- The objectives are to improve educational practices in local educational agencies through funding of exemplary of innovative programs. Funding proposals are competitive at the state level and must include: (1) Information on how the computer will contribute to upgrading district learner objectives; (2) Information on how in-service training and

performance will be accomplished; (3) Information on how the local school district will evaluate the results of the program. When these criteria are met, funding proposals may include the purchase of computer, instructor's curriculum guide, user's manual, individual student manuals, and software programs. The funds are especially for, but not limited to, basic and general mathematics application.

There is pressure on school systems throughout the United States, including those in Wisconsin, to provide the knowledge and expertise necessary for business and office education graduates entering data processing situations. Many schools are faced with the decision whether to purchase an electronic data processing system(s).

There are several points to evaluate when considering electronic data processing system(s).

1. The technology in electronic data processing equipment is changing so rapidly that the equipment purchased today could be obsolete in one or two years.

2. With high cost equipment there is the tendency to teach to a particular machine, rather than emphasize the skills and knowledge that transfer from one machine to another.

If a school district or school, after careful research, chooses to purchase, lease, or rent electronic data processing equipment, the students' exposure to the equipment should be twofold: first, students should know how the electronic data processing systems can be used to increase business and office productivity; and, second, students should receive an acquaintanceship skill on the equipment with emphasis on those applications that transfer from one electronic data processing system to another.

Department of Public Instruction
Criteria to be Considered When Approving
Electronic Data Processing Equipment

1. Teacher

   a. Completed a university course, seminar, or workshop devoted to the basic concepts of data processing. Must participate before getting equipment. The DPI state supervisor may waive this requirement if appropriate occupational experience and/or vendors training has been completed.

   b. Completed a university course, seminar, or workshop devoted to the methodology of teaching data processing curriculum. Must participate before getting second year funding of equipment. The DPI state supervisor may waive this requirement if successful teaching experience has been performed in the area of data processing.

2. Document the need for educating high school students on the equipment.

   a. Support from advisory committee
   b. Community survey
   c. Other

3. Equipment

   a. Rationale for choosing the specific equipment requested
   b. Justification for decision to lease, rent, or purchase
   c. How will equipment use be maximized each day--equipment utilization plan/schedule.

4. Curriculum plan

   a. Curriculum for utilizing this equipment in the instructional program
   b. Plan for evaluating curriculum (instruction)
   c. Follow-up on each student completing the prescribed instructional program after 6 months with additional information on the regular follow-up

Articulation

CURRICULUM ARTICULATION

In order to benefit the student to the fullest, articulation is essential:

1. among the business education courses
2. between the business education courses and other courses in the school
3. Between the high school and post-secondary schools
4. Between the high school and the employment community

The following are suggestions to facilitate articulation of the curriculum.

THE BUSINESS EDUCATION DEPARTMENT

--Discuss equipment needs on a departmental basis--consider data processing and word processing applications.

--Inform faculty members through inservice programs within the department about data processing programs and how computers could be used in their programs.

--Determine who will teach the data processing courses. Consideration may be given to the team-teaching approach or the exchange of faculty members within courses for a short period of time.

--Coordinate the curriculum so that faculty members can avoid the overlap of content within business education courses.

--Provide orientation for faculty members on all data processing equipment installed.

--Encourage all members to attend workshops, in-service training, or summer courses on data processing.

--Encourage faculty to promote data processing-extracurricular activities and competitive events.

WITHIN THE SCHOOL

--Have data processing students write programs that have application in other courses in school.

--If equipment is to be shared with other departments, determine where the equipment will be located and what timetable will be used.

--Work out data processing course content to avoid overlapping between courses throughout the school.

--Determine supplies needed and who will be responsible for ordering. Also determine budget amounts by departments.

POST-SECONDARY SCHOOLS

--Visit secondary and post-secondary schools to check on data processing: curriculum, data processing equipment, and languages.

--Encourage post-secondary faculty participation on your advisory committee.

--Inform post-secondary faculty of your data processing program and encourage them to give your students advanced placement opportunities.

--Encourage the post-secondary school to sponsor student competitive events.

EMPLOYMENT COMMUNITY

--Survey and/or visit businesses in the employment community to learn their data processing personnel needs, the type of equipment and languages used, and their interest in data processing education.

--Survey past graduates concerning suggested additions, deletions, and benefits of the data processing program; description of job requirements and duties, and equipment used at present job or current education.

--Make use of regular news releases to inform the public of the success of your program and individual successes of your students.

--Conduct an open-house to present your equipment and facilities.

--Discuss data processing career possibilities during parent conferences.

Appendix

PROPOSAL WRITING

The purpose of preparing a proposal is to secure authorization for some course of action (initiate a new program, release for professional meetings, purchase new equipment, expand facilities, etc.) that the proposer feels would benefit the teacher, department, or school.

The modern business proposal is a businesslike proposition arranged in an organized format that is either solicited (offering to provide a service which the customer says he needs) or unsolicited (offering to provide a service or product which the customer may not presently need, may not be familiar with, and may not have the money for.) A modern educational proposal may be used for similar purposes.

A cover letter is written which explains the purpose, the people involved, the benefits to be derived, and a request for consideration and support of the proposal.

The following outline will provide a framework for a proposal. Omit those points which do not relate to the specific proposal being prepared.

I. TITLE PAGE

II. INTRODUCTION

- A. Identification of the Problem
- B. Immediate Background of the Problem
- C. Need for Solution of the Problem

III. OBJECTIVES OR PURPOSES

IV. JUSTIFICATION

- A. Identify Benefits that Will Come from the Solution
- B. Indicate that this Proposal is not Dependent on the Accomplishment of Other Changes in the Program

V. IMPLEMENTATION

A. Methods to be Used

A plan to attack, a method of operation, a systematic analysis of intended procedures to attest to the proposer's practical "know how"

B. Task Breakdown

Breaking a project into its various tasks giving some assurance that the total job will be done in an orderly manner and to be and to be completed on schedule.

C. Time and Work Schedule

In any type of project or procedure, the calendar period is specified within which projects are to be completed.

D. Facilities Available

Before the proposal is prepared, determine the means and facilities the proposed work will require.

VI. PERSONNEL

A. Individuals Involved

B. Qualifications Appropriate for the Proposal

VII. REFERENCES (if applicable to the type of proposal)

Include the names and addresses of individuals, companies, and agencies that are able and willing to testify in your behalf.

VIII. Likelihood of Success.

Within the bounds of time, money, and means, simply guarantee a limited solution.

IX. Costs (Budget Figures)

X. Appendix (where applicable)

May include illustrations and supporting documents which will further illustrate.

Example A: One item from a proposal which requests equipment.

Exhibit for Project in Business Teacher Education and Office Administration to Overcome Deficiencies in Classroom Equipment:

Deficiencies to be Remedied

Presently, three courses (advanced typewriting, business communications, and secretarial office procedures) are utilizing the dictation/transcription equipment that we have. We have 20 dictation/transcription machines, one-third of them are five years old or older, another third break down frequently.

Over 450 students per semester use these machines. With 240 students in eight sections of Business Communications, we don't have enough machines to go around. Also, when machine malfunctions occur, we have additional scheduling problems.

We need new dictation/transcription equipment in greater quantities.

Example B: A proposal letter sent to an administrator requesting release of a teacher from classroom duties for one day to attend the annual Wisconsin Business Education Association convention.

Current Date

Superintendent
School District
City, State ZIP

Dear _____:

I would like to be released from my teaching duties on Friday, _____, so that I may attend the Wisconsin Business Education Association convention in _____, Wisconsin.

Being an active member of a professional organization is important to the continuing development of the business education department. Attendance at the meetings, conferences, and conventions enables me to keep current with developments and provides additional teaching materials.

The Wisconsin Business Education Association has an outstanding two-day conference on Friday and Saturday, _____ and _____. The program features authorities who are recognized as leaders in business and business education. A copy of the program is enclosed.

Sincerely yours,

Business Education

Enclosure

Insert this paragraph if an assignment is accepted at the conference.

The Convention Chairman has requested that I serve as _____ in the _____ section listed on page _____ of the program. As soon as I receive permission to attend, I will accept the responsibility. I must reply by _____.

Example C: A letter proposal which modifies a proposal in progress. A similar format could be used to obtain small amounts of money or short-range changes in the department's business education program.

Current Date

Mr. Mike Tokheim
Department of Public Instruction
126 Langdon Street
Madison, WI 53702

Dear Mr. Tokheim:

REQUEST TO REINSTATE THE POSTAGE FUNDING FOR THE JULY 1 FISCAL PERIOD

Problem

The Handbook for Business and Office Education Teachers is now complete and the publication is in press. Due to the crossover of fiscal periods, however, the funding allocated for postage to mail the handbookds was not encumbered.

Need

The original grant allocated $300 for the purpose of distributing the handbooks. At this time, it is believed to be a sufficient amount to cover the postage costs.

Request

Would DPI reinstate $300 necessary to cover the costs of distributing the Handbook for Business and Office Education Teachers?

Your help in securing the necessary funding will be appreciated.

Sincerely,

Dr. Ron Schlattman
Project Director

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SPECIAL CONSIDERATIONS

An effective proposal should include some of these points:

1. Be reader oriented
2. Brief
3. Logical
4. Impersonal
5. Positive
6. Consistent and parallel
7. Authoritative
8. Complete

The following are reasons a proposal may be rejected:

1. the proposed program is too costly (disregard for available funding)
2. the problem is stated in an oversimplified manner
3. lack of understanding of the educational requirements
4. failure to comply with the specific requirements of a request (Alternatives should not be proposed unless specifically permitted.)
5. over optimism in performance estimates, or promises not substantiated by the facts
6. vague generalities and sweeping statements which appear to cover a lack of knowledge
7. proposing extended scope or time schedules (this has the same effect as telling the administrator that he doesn't know what he wants)

It might be advisable to apply a checklist of items before submitting the proposal.

1. Is the general appearance of the proposal attractive?
2. Is the proposal cost/benefit effective?
3. Is it consistent within itself?
4. Did the proposal serve its intended purpose?
5. What would be the effect if the proposal were approved?

DATA PROCESSING ACRONYMS

ACM - Association for Computing Machinery

ADP - Automated Data Processing

AEDS - Association for Education Data Systems

AFIPS - American Federation of Information Processing Societies

ALGOL - Algorythmic Language

ALU - Arithmetic/Logic Unit

AMS - Administrative Management Society

ANSI - American National Standards Institute

APL - A Programming Language

ARU - Audio Response Unit

ASCII - American Standard Code for Information Interchange

ASM - Association for Systems Management

ASVB - Armed Services Vocational Aptitude Battery

ATM - Automatic Teller Machine

ATS - Administrative Terminal System

AVA - American Vocational Association

BASIC - Beginner's All-Purpose Symbolic Code

BAVI - Bureau of Audio Visual Instruction

BCD - Binary-Coded Decimal

BPI - Bits per inch

BPS - Bits per second

CAI - Computer-Assisted Instruction

CBE - Competency Based Education

CDE - Certified Data Education

CDP - Certificate in Data Processing

CESA - Cooperative Educational Services Agency

CETA - Comprehensive Employment and Training Act

CLEP - College Level Examination Program

CMLI - Computer-Management Instruction

COBOL - COmmon Business Oriented Language

COM - Computer Output Microfilm

COOP - Cooperative Office Occupations Program

CPM - Critical Path Method

CPS - Characters per second

CPU - Central Processing Unit

CRT - Cathode Ray Tube

DASD - Direct Access Storage Device

DBMS - Data Base Mangment System

DLT - Decision Logic Table

DOS - Disk Operating System

DOT - Dictionary of Occupational Titles

DP - Data Processing

DPMA - Data Processing Management Association

DSK - Dvorak Simplified Keyboard

EAM - Electrical Accounting Machine

EBCDIC - Extended Binary Coded Decimal Interchange Code

EDP - Electronic Data Processing

EDSAC - Electronic Delay Storage Automatic Computer

EDVAC - Electronic Discrete Variable Automatic Computer

EFT - Electronic Fulds Transfer

ENIAC - Electronic Numberical Integrator and Computer

FORTRAN - FORmula Translator

GASP - Gas Plasma Display

GIGO - Garbage In-lGarbage Out

HIPO - Hierarchy plus Input Processing Output

IBG - InterBlock Gap

IBM - International Business Machines

IMC - Instruction Media Center

I/O - Input/Output

IRG - InterRecord Gap

ISE - Individual Self-Pacing

IWPA - International Word Processing Association

JA - Junior Achievement

JCL - Job Control Language

K - Kilo (1,000 units)

LPH - Lines per hour

M - Mega (1,000,000 units)

MBM - Magnetic Bubble Memory

MCST - Magnetic Card Selectric Typewriter

MICR - Magnetic Ink Character Reader

MIS - Management Information Systems

MOOP - Model Office Occupations Program

MSR - Marketing Support Representative

OCR - Optical Character Recognition

OMR - Optical Mark Recognition

OS - Operating Systems

PBX - Private Branch Exchange

PERT - Program Evaluation and Review Technique

PIP - Peripheral Interchange Program

PL/1 - Programming Language One

POS - Point of Sale (terminal)

PROM - Programmable Read Only Memory

RAM - Random Access Memory

ROM - Read Only Memory

RJE - Remote Job Entry

RPG - Report Program Generator

SBS - Satellite Business System

SE - Systems Engineer

TI - Texas Instruments

TWX - Teletypewriter

UPC - Universal Product Code

VDT - Video Display Terminal

VORs - Voice Operated Relays

VS - Virtual Storage

WATS - Wide Area Telephone Service

WOIS - Wisconsin Occupational Information System

WP - Word Processing

WPM - Words per minute

ZIP - Zoning Improvement Plan